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poems, romances, or general reading-matter, — it is the right and duty of congress, under the general urgency clauses of the constitution, to at once enact statutes for the public welfare and relief.

It has never been denied, I think, that, in times of great dearth or stress or suffering, extraordinary powers can be construed into that clause, for the general good of the whole people.

It seems to me, however, that there is no doubt possible but that congress would have power to simply amend its present copyright act by substituting the word 'person' for the words 'citizen of the United States,' which would at once give a perfect and absolute international copyright, and the best one possible; since any new and separate act would at once be brought before the courts for construction, whereas the word 'person' could hardly need judicial interpretation. This was the plan suggested by me in 1875, and I have seen no reason to depart from it since.

APPLETON MORGAN.

#### A recent ice-storm.

In answer to the question of Mr. W. M. Davis, printed on p. 190 of *Science* (vii. No. 160), I would suggest the following, deduced from observations of the effects of many similar storms, though the particular storm referred to, of Feb. 11–13, did not trouble the trees so much in this neighborhood as farther inland and farther north; for the temperature near Boston was not quite low enough to form much ice at that time.

Pine-trees make branches nearly at right angles with their trunks, and these branches become more and more pendant in their habit as they grow older. It follows, that, when an old tree is loaded down with ice, the branches can bend downward till they rest part of their weight on those below, and the lowest ones on the ground, without any abrupt bending at any one point. Moreover, pine wood, when alive, is quite tough, and will bear a good deal of distortion without fracture. The same reasons operate to protect our other coniferous trees of the spruce and fir tribes.

The white-oaks, although peculiar in retaining a good deal of their last year's foliage in winter, and carrying thereby a heavy load of ice on such occasions, have a prodigiously strong fibre, and, when alive, the branches possess great toughness. Any one who has tried to break a small limb from a living white-oak tree knows that it is nearly impossible. The white-oaks of Worcester county, Mass., are famed for the hardness and toughness of their wood, which is fully twice as strong to resist fracture while green as that of the white-oaks of the western states, though probably similar to the same kind of oaks growing near the same latitude, and as near the sea in other states.

On the other hand, the maples, elms, ashes, beeches, and many other deciduous trees which abound in the district referred to by Mr. Davis, make branches that pursue an upward direction, and continue to bifurcate, as they grow upward, at small angles both with one another and with the parent stem or trunk; while their fibre lacks toughness, i.e., is easily split in most cases. When these upright branches bend downward with the load of ice, the mechanical problem is quite different from that existing in the pines and spruces: for, as the branches of these evergreens become more and more pendant,

their centres of gravity, after getting below their point of origin, as they soon do, approach the trunk, and therefore exert less and less leverage the more they bend; while in the case of a beech, ash, maple, or elm tree, the centres of gravity of the upright branches depart from the vertical line of the trunk or point of bifurcation, and gain in leverage to effect fracture as they bend down, till they pass the horizontal; and then resistance to splitting is so feeble, that they often split at the fork before getting down as far as a horizontal position.

Among ornamental trees are some of peculiarly weak fibre which suffer extremely from ice-breakage. Such is the *Virgilia lutea*, of which I have some large specimens thus mutilated, though still very beautiful trees in June.

EDWD. S. PHILBRICK.

Brookline, Mass., March 1.

#### Habits of batrachians.

I have been unable to obtain information regarding the habits of the Amphiumidae of the United States, — *Cryptobranchus* or *Menopoma*, *Amphiuma*, *Necturus*, *Siren*, etc. (hellbenders, mudpuppies, etc.). Can any of the readers of *Science* tell where and when they are common, their larval habits, egg-laying habits and seasons, etc.?

GEORGE BAUR.

Yale coll. museum, New Haven, Conn.

#### A tornado brood in Hampshire county, Mass.

I find some additional notes, made at the time, from which it appears that the storm resulting in the destruction of Northampton bridge, June 14, 1877, exhibited at first a whirl in the shape of a huge umbrella hanging from the main cloud, the convexity upward: its destructive career may therefore be interpreted as a tornado. I find, also, notes of a tornado at Westfield, July 9 of the same year. This was reported as coming down the gorge of the Westfield River, and thus confirms my view of the origin of the tornadoes I described (*Science*, Feb. 5) as having their point of departure over the Mill River branch-valley.

H. W. P.

#### 'Marvels of animal life.'

In a notice of 'Marvels of animal life,' in *Science* of Jan. 1, your reviewer says, "It will surprise some readers to see man and the Pteranodon represented on plate 31 as contemporaneous." The human figure was introduced in the cut merely to give young people some idea of the size of the animal, and was intended to have no other significance, the omission of this explanation in the text being an oversight.

C. F. HOLDER.

Pasadena, Cal., Feb. 17.

#### The competition of convict labor.

In reading Mr. Langerfeld's letter in *Science* of Feb. 19, one point occurs to me. He finds fault with my arithmetic. Now, I made it clear in one of the earlier articles that the competing power of convicts was in this country only about sixty per cent of what their numerical strength would seem to give them. In my letter printed in your issue of Feb. 12, all this was taken for granted, as I was unwilling to cumber your space with a repetition.

NICHOLAS MURRAY BUTLER.

New York, Feb. 25.